
Streambank Protection Project
North Nashua River
Sewer Line
Leominster, Massachusetts

Operation and Maintenance Manual

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US Army Corps
of Engineers
New England Division

OPERATION AND MAINTENANCE MANUAL
EMERGENCY STREAMBANK PROTECTION PROJECT
NORTH NASHUA RIVER
LEOMINSTER, MASSACHUSETTS

FOREWORD

The Leominster, Massachusetts Streambank Protection Project, at the Leominster Wastewater Treatment Plant, consisting of stone slope protection, was designed and constructed to stabilize the streambank along North Nashua River. The successful functioning of the streambank stabilization works is not assured solely by the construction of the stone slope protection along the streambank since the forces of nature, in this case, high velocity flows and flood stages, will continue to attack the streambank. If the system is to perform the functions for which it was designed, it must be carefully maintained not only during periods of normal flow stages, but also following subsequent flood periods.

The purpose of this manual is to provide information regarding actual maintenance procedures and outline the responsibilities of the parties involved. In general, the regulations assess non-Federal interests as having responsibility for the operation and maintenance of the project. Therefore, the Massachusetts Department of Environmental Management (Massachusetts DEM) should assure that several local individuals be familiar with this project and have a thorough understanding of the recommended methods of maintaining the system.

The general flood control Regulations for Operation and Maintenance of Flood Control Works quoted herein were approved by the acting Secretary of War on August 9, 1944. Established by the Department of Defense, the improvement of rivers and harbors and other waterways for flood control and other purposes, formerly under jurisdiction of the Secretary of War, became the responsibility of the Secretary of the Army. References herein to the Secretary of War and War Department shall be construed to mean, respectively, the Secretary of the Army and the Department of the Army. Where reference is made to the District Engineer in the Regulations included in this manual, it shall be construed to mean the Division Engineer, New England Division, Corps of Engineers.

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SECTION I

1. AUTHORIZATION

Construction of the streambank stabilization project on the North Nashua River at Leominster, Massachusetts (Sewer Line) was authorized by the Division Engineer, New England Division of the Corps of Engineers, on September 12, 1994 pursuant to the authority contained in Section 14 of the Flood Control Act of 1946, and subsequent "Continuing Authorities Program Performance Improvement - Change in Section 14 Procedures," dated 30 July 1994 as amended.

2. LOCATION

The City of Leominster is located in northern Worcester County in north-central Massachusetts, and approximately 34 miles northwest of Boston.

3. DESCRIPTION OF DAMAGE

About 480 feet of the west riverbank of the North Nashua River in the vicinity of the Leominster Sewage Treatment Plant was in danger of failing as a result of continued erosion. This condition threatened to undermine a 36-inch reinforced concrete sewer pipe traveling along the riverbank which would have resulted in the discharge of untreated sewage into the river.

4. DESCRIPTION OF PROJECT

The completed project consists of backfilling of eroded areas along the slope with compacted random fill and then covering with succeeding layers of 1 foot of gravel bedding, 1 foot of stone bedding and 30 inches of stone slope protection as shown on sheet 4 in Appendix D. The revetment also included removal of accumulated snags and debris on the opposite riverbank and minor shaping of flood plain lands that project into the river and cause a constriction of river flows.

5. PROTECTION PROVIDED

The streambank protection will prevent erosion of the embankment along the North Nashua River and maintain the integrity of the 36 inch sewer line.

6. CONSTRUCTION HISTORY

The project was constructed by Bates Construction Co. of Clinton, Massachusetts during the period from September 1995 to September 1996 at a cost of \$ 190,191.

7. ASSURANCES OF LOCAL COOPERATION

The Army Corps of Engineers and the Massachusetts DEM entered into an agreement for local cooperation for this streambank stabilization project on December 1, 1994. The agreement provides that the local sponsor shall, among other required responsibilities, maintain the project after its completion without cost to the Federal Government. A copy of the formal local assurance is included as Appendix B.

8. PLANS

Reduced size drawings showing the project as actually constructed are included as Appendix D.

SECTION II GENERAL REGULATIONS

9. PURPOSE OF THIS MANUAL

The purpose of this manual is to present detailed information to be used as a guide in complying with "Flood Control Regulations - Maintenance and Operation of Flood Control Works" as approved by the Acting Secretary of War on August 9, 1944, and published in this volume as Appendix A. In executing assurances of local cooperation, the Massachusetts DEM has agreed to maintain and operate the completed works in accordance with these regulations. The regulations, which are intended to cover all local protection projects constructed by the Department throughout the United States, are general in nature and obviously cannot give detailed instructions for the maintenance and operation of a specific project. The details set forth in this manual for maintenance and operation for the Massachusetts DEM project are intended to supplement the regulations to obtain all the benefits and protection against erosion for which the project was designed. Failure to maintain and operate the project as required by the regulations, and as detailed herein, could cause property losses and could result in an irreparable loss of confidence in the streambank protection system.

10. GENERAL RULES AND REGULATIONS

Paragraph 208.10 (a) of the regulations prescribed by the Secretary of War gives general rules for the maintenance and operation of structures and facilities constructed by the United States for local protection. Applicable portions are quoted below to avoid the necessity for cross reference and are further defined by remarks under each quotation.

"(1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits;"

These requirements cannot be over stressed, and the Massachusetts DEM authorities must make adequate provisions for funds, personnel, equipment, and materials to allow for

the proper maintenance and operation of the streambank protective works.

"(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with the regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States;"

The committee should be composed of competent members, preferably persons experienced in engineering or construction works. The committee must be given broad authority to carry out its responsibilities. The name, address and office and home telephone numbers of the Superintendent, and any changes thereof, shall be promptly furnished to the Division Engineer, New England Division, Corps of Engineers.

"(3)" N/A

"(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the right-of-way for the protective facilities;"

Access to the project has been established for necessary maintenance equipment. These right-of-ways are essential and must be kept open at all times.

"(5) No improvement shall be passed over, under, or through the walls, levees, improved channels, or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the Division Engineer of the War Department or his authorized representative that such improvement,

excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations, as may be found to be desirable and permissible under the above determination, shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project, and information concerning methods of construction acceptable under standard engineering practice, shall be obtained from the Division Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the Division Engineer after completion of the work;"

Any contemplated improvements or alterations as outlined above must be submitted to the U.S. Army Corps of Engineers, New England Division, Waltham, Massachusetts, and the approval of the Division Engineer obtained prior to Massachusetts DEM authorizing the work. All requests for approval shall be in writing and complete drawings in duplicate. One set, which shall be in reproducible form, must be submitted along with a full description of the work intended. The Massachusetts DEM will be held responsible for obtaining prior approval from the Corps of Engineers for any improvements or alterations proposed by itself, private parties, or any public parties. The Massachusetts DEM shall furnish the Division Engineer as-built drawings, in duplicate, of the completed work.

"(6) It shall be the duty of the Superintendent to submit a semi-annual report to the Division Engineer covering inspection, maintenance, and operation of the protective works;"

See paragraph 13 of this Section for instructions on submitting reports.

"(7) The Division Engineer, or his authorized representatives, shall have access at all times to all portions of the protective works;"

The Division Engineer, or his representatives, will make

periodic inspections of the protective works to determine if the project is being properly maintained and operated by the Massachusetts DEM.

"(8) Maintenance measures or repairs, which the Division Engineer deems necessary, shall be promptly taken or made;"

The Massachusetts DEM should maintain the facilities and keep them in good repair and not wait for the Division Engineer to call such matter to its attention. Upon request, the Division office will advise the Massachusetts DEM how to make any major repairs to the facilities.

"(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods;"

The project is designed to prevent erosion of the streambank under an existing 36-inch sewer line, which would result in failure of the sewer line and discharge of untreated sewage into the North Nashua River. It does not provide protection against flooding, possibly impacting local activities associated with the site.

"(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations;"

The flood control committee should familiarize itself with the contents of this manual. The Massachusetts DEM authorities are encouraged to call on the Division Office of the Corps of Engineers for any additional advice or instructions required by them in carrying out Massachusetts DEM obligations for maintaining and operating the protection facilities.

11. MAINTENANCE

a. The word "maintenance," as used in this manual applies

to the upkeep, repair, replacement, and care of the work constructed by the United States and turned over to the Massachusetts DEM. If the work is neglected, there will be deterioration and possible failure in flood time when there is dire need of dependable protection.

b. Maintenance includes a regular walking inspection over the entire system. The purpose of the inspection is to detect any deterioration of project features that indicates a need for repair or replacement, and also to detect any restrictions in the stream, channel, or floodway that reduces flow capacity.

12. OPERATION

a. The term "operation," as used in this manual, refers to the actual functions of the various features of the protection works during abnormal river stages.

b. When abnormal river stages are expected, it is important that the Superintendent make immediate decisions, take prompt action and carry out decisions to insure proper continued operation of the protection works.

c. To insure correct operation, the following items are considered to be essential:

(1) At least one person (preferably 2 or 3) be familiar with the protection project including the various types of materials comprising the streambank protection project.

(2) Sources for project materials should be established ahead of time. If possible, a small amount of each type of material should be stockpiled nearby for quick use.

(3) Sufficient loading, hauling, and placing equipment should be readily available for providing and placing the repair materials.

(4) Sufficient experienced personnel should be readily available for patrolling and performing the repair work.

13. REPORTS

a. The regulations prescribed by the Secretary of the Army call for semi-annual reports to be submitted by the Superintendent to the Division Engineer covering inspection and maintenance. Inspection of the protective facilities shall be made immediately prior to flood seasons, immediately following floods and at intervals not exceeding 90 days as required by regulations.

b. To assist the Superintendent in making his inspection, a sample form is included in Appendix C. The Superintendent shall have additional copies printed for use in submitting his reports.

c. The semi-annual reports shall be submitted in triplicate to the Division Engineer each May and November. The reports will be submitted in letter form with copies of the inspection forms covering the inspections made during the period of the reports. The reports shall cover the following points:

(1) A description of the maintenance work performed in the preceding six months.

(2) The number and classification of men working on maintenance, regularly and intermittently.

(3) Description of any work performed by contract on the repair or improvements of the project.

SECTION III

STREAMBANK PROTECTION WORK

14. DESCRIPTION

The Leominster streambank protection project consists of an area about 480 feet long on the west riverbank of the North Nashua River adjacent to the Leominster waste water treatment plant. The project includes backfilling of eroded areas then covering with succeeding layers of 1 foot of gravel bedding, 1 foot of stone bedding and 30 inches of stone slope protection as shown on sheet 4 in Appendix D. An 8 foot toe is placed on the bottom of the embankment to provide a foundation for the protection.

In addition to the rock slope protection, the project included channel excavation on the opposite side of the river to compensate for project encroachment into the floodway and to maintain channel width.

An area just upstream of the project area, and on the opposite side of the river was developed to mitigate for loss of approximately 1,400 square feet of wetlands in the project area.

Details of the project are shown in appendix D.

15. MAINTENANCE

Paragraph 208.10(g) (1) of the prescribed regulations sets forth rules for the maintenance of channels and floodways. These rules are quoted below, followed by brief comments where applicable to clarify these rules as they apply to the project.

Channels and Floodways. - (1) Maintenance. - Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:"

"(i) the channel or floodway is clear of debris, weeds and wild growth;"

All debris and vegetative growth except grasses, at the protective work shall be removed promptly. Failure to remove shrub and tree growth could eventually lead to structural damage to the stone slope protection from the root systems.

"(ii) the channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;"

Dumping of waste materials or any types of encroachment on the protective work is prohibited and prompt steps shall be taken to remove any encroachments

"(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;"

Shoal areas should be removed, but care should be exercised that slopes of the channel and existing banks are not undercut or damaged. Existence of shoal areas will be apparent from inspections during time of low flow.

"(iv) Banks are not being damaged by rain or wave wash and that no sloughing of banks has occurred;"

Banks shall be inspected for damage by rain or wave wash or by sloughing and repaired promptly using materials similar to that used in their original construction. Inspections shall be made at interval not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections.

"(v) Riprap sections ... are in good condition;"

Rock slope protection must be maintained in good condition to resist erosion. Any damage or loss of riprap due to slides or vandalism must be corrected. Periodic checks should be made of the riprap to detect movement, damage, or losses; and prompt corrective actions should be taken. Such inspections shall be made at intervals not to exceed 90 days. Immediate steps shall be taken to remedy any adverse conditions disclosed by such inspections.

"(vi)" N/A

16. OPERATION

Paragraph 208.10(g)(2) of the prescribed regulations gives rules for operation of channel and floodways. These rules are paraphrased below with regard to the project.

The streambank along the project area shall be patrolled during periods of high water and measures taken to protect those reaches being attacked by the current. Immediate appropriate measures shall be taken to prevent the formation of jams of ice or debris, and large objects which become lodged against the bank shall be removed. The project shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damages to the project shall be repaired.

APPENDIX A

**REGULATIONS PRESCRIBED
BY THE
SECRETARY OF THE ARMY**

TITLE 33-NAVIGATION AND NAVIGABLE WATERS

Chapter II-Corps of Engineers War Department-Part 208-Flood Control Regulations Maintenance and Operation of Flood Control Works

(Retyped verbatim from
original document)

Pursuant to the provisions of Section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented (49 Stat. 1571; 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

208.10 Local flood protection works; maintenance and operation of structures and facilities- (a) *General.*

(1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with the regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent", who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District

Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice.

Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval.

Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the Superintendent to submit a semi-annual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations.

(b) *Levees-*(1) *Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable

growth areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross-section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drafters are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during appropriate seasons, which will retard or destroy the growth of the sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days, and such immediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability to adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls - (1) Maintenance.* Periodic inspections shall be made by Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall & offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect

the concrete and construction joints. Immediate steps shall be taken to correct any conditions which endanger the stability of the wall.

(d) *Drainage structures - (1)*

Maintenance. Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on drainage structures shall be examined, oiled, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanisms, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures in that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structures which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impede, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures and levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse conditions.

(e) *Closure structures - (1)*

Maintenance. Closure structures for the traffic openings shall be inspected by the Superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All moveable parts are in satisfactory working order;

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sandbag closures and that the location of such materials will be readily accessible in times of emergencies.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each three-year period. Trial erections of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure in feasible, rigorous inspection and drill of operating personnel may be substitute therefore. Trial erection of sandbag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) *Operation.* Erection of each moveable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for the ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) *Pumping plants*

(1) *Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery. Adequate supplies of lubri-

cants for all types of machine, fuel for gasoline or diesel powered equipment, and flashlights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be tried operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subject to undue dampness and otherwise at intervals not to exceed one-year period. A record shall be kept showing the results of such test period. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be properly replaced. Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their service ability in times and emergencies. Only skilled electricians and mechanics shall be employed on test and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be repaired or replaced as soon as practicable and shall be tried operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above hyphenated mentioned "Operation Instructions" and care shall be exercised at proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pumphouse sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished to the District Engineer following each flood.

(g) *Channels and Floodways -*

(1) *Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste material, building of unauthorized structures or encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operations.* Both banks of the channel shall be protrolled during periods of high waters and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable there- after, all snags and other debris shall be removed and all damage to the banks, riprap, deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) *Miscellaneous Facilities - (1) Maintenance.* Miscellaneous structures and facilities constructed as part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and the

appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior runoff during flood period shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where applicable, shall provide temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless design therefore.

(49 Stat. 1571, 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1) (Regs. 9 August 1944, CE SPEWF)

[SEAL] J.A. ULIO

Major General

The Adjutant General

[F.R. Doc 44-12255; Filed,
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APPENDIX B

**ASSURANCES OF LOCAL
COOPERATION**

UNITED STATES ARMY CORPS OF ENGINEERS
CONTINUING AUTHORITIES PROGRAM

SECTION 14
SINGLE PURPOSE
EMERGENCY STREAMBANK OR SHORELINE PROTECTION WORKS

LOCAL COOPERATION AGREEMENT

BETWEEN

THE DEPARTMENT OF THE ARMY

AND

Commonwealth of Massachusetts

Department of Environmental Management

Division of Waterways

[FULL NAME OF LOCAL SPONSOR]

FOR CONSTRUCTION OF THE

Emergency Streambank Protection - Main Trunk Sewer Line

North Nashua River - Leominster, Massachusetts

[FULL NAME OF PROJECT]

THIS AGREEMENT, entered into this _____ day of _____,
19____, by and between the DEPARTMENT OF THE ARMY (hereinafter
referred to as the "Government"), acting by and through
the New England Division Engineer, U.S. Army
[LOCATION OF DISTRICT] [DISTRICT/DIVISION]

Corps of Engineers, and Commissioner, Department of Environmental
Management (MADEM)

[LOCAL SPONSOR]

(hereinafter referred to as the "Local Sponsor"), acting by and
through Peter C. Webber, Commissioner, Department of Environmental
Management.

[TITLE OF PERSON SIGNING THIS AGREEMENT]

WITNESSETH, THAT:

WHEREAS, the authority for the construction of
the Emergency Streambank Protection Project

[NAME OF PROJECT]

at Main Trunk Sewer Line, North Nashua River at Leominster, MA.

[SPECIFIC LOCATION OF PROJECT]

(hereinafter referred to as the "Project," as defined in Article
I.a. of this Agreement) is contained in Section 14 of the Flood
Control Act of 1946, as amended, 33 U.S.C. 701r; and

WHEREAS, Section 14 of the Flood Control Act of 1946, as
amended, limits the amount the Federal Government may expend on a
single project to \$500,000; and

WHEREAS, construction of the Project is described in a report
entitled Detailed Project Report, Main Trunk Sewer Line, North Nashua

River, Leominster, Massachusetts Emergency Streambank Protection Project;

prepared by New England Division, dated 28 July 1992, and
approved by Chief of Engineers on 9 October 1992;

[DATE]

and,

WHEREAS, Section 103 of the Water Resources Development Act of
1986, Public Law 99-662, specifies the cost-sharing requirements
applicable to the Project; and

WHEREAS, Section 221 of the Flood Control Act of 1970, Public Law 91-611, as amended, provides that the construction of any water resources project by the Secretary of the Army shall not be commenced until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project; and,

[ONLY ONE OF THE TWO FOLLOWING "WHEREAS" CLAUSES WILL APPLY;
STRIKE THROUGH THE CLAUSE WHICH DOES NOT APPLY]

[OPTION 1:]

~~WHEREAS, the Project does not qualify for a reduction of the maximum non-Federal cost share pursuant to guidelines which implement Section 103(m) of the Water Resources Development Act of 1986, Public Law 99-662, published in 33 C.F.R. sections 241.1 - 241.6, entitled "Flood Control Cost-Sharing Requirements Under the Ability To Pay Provision"; and the reduced maximum non-Federal cost share as determined by the ability to pay test is _____ percent, derived as set out in Exhibit _____ to this Agreement, subject, however, to the cost limitations placed on the Federal Government by Section 14 of the Flood Control Act of 1946, as amended; and~~

[OPTION 2:]

WHEREAS, the Project does not qualify for a reduction of the maximum non-Federal cost share pursuant to guidelines which implement Section 103(m) of the Water Resources Development Act of 1986, Public Law 99-662, published in 33 C.F.R. sections 241.1 - 241.6, entitled "Flood Control Cost-Sharing Requirements Under the Ability To Pay Provision"; and

WHEREAS, the Local Sponsor has the authority and capability to furnish the cooperation hereinafter set forth and is willing to participate in cost-sharing and financing in accordance with the terms of this Agreement;

NOW, THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this Agreement:

a. The term "Project" shall mean Construction of approximately 400 Linear feet of slope protection along the North Nashua River. The protection will stop erosion of the streambank and prevent exposure of a 36-inch reinforced concrete sewer line and its eventual rupture and discharge of untreated sewage into the North Nashua River.

[DESCRIBE THE WORK TO BE UNDERTAKEN PURSUANT TO THIS AGREEMENT IN SUFFICIENT DETAIL AS IS NECESSARY TO AVOID ANY CONFUSION OVER WHAT WORK IS, OR IS NOT INCLUDED; REFERENCE THE PROJECT REPORT, IF APPROPRIATE; IF MORE SPACE IS NEEDED, REFERENCE AND SECURELY ATTACH A SEPARATE SHEET AND HAVE ALL SIGNATORIES INITIAL IT WHEN THEY SIGN.]

b. The term "total project costs" shall mean all costs incurred by the Local Sponsor and the Government directly related to construction of the Project. Such costs shall include, but not necessarily be limited to, costs of applicable engineering and design, costs of preparation of contract plans and specifications, actual construction costs, costs of alterations or relocations of railroad bridges and approaches thereto, supervision and administration costs, costs of construction contract dispute settlements or awards, and the value of lands, easements and rights-of-way (to the extent that the lands, easements and rights-of-way are not already owned as part of the facility being protected), relocations, and suitable borrow and dredged material disposal areas provided for the Project by the Local Sponsor, but shall not include any costs for betterments, operation, repair, maintenance, replacement nor rehabilitation, nor Government costs for planning studies.

c. The term "period of construction" shall mean the time from the advertisement of the first construction contract to the time of acceptance of the Project by the Contracting Officer.

d. The term "Contracting Officer" shall mean the U. S. Army Engineer for the New England Division or
[LOCATION] [DISTRICT/DIVISION]
his or her designee.

e. The term "highway" shall mean any highway, thoroughfare, roadway, street, or other public road or way.

f. The term "fiscal year" shall mean one fiscal year of the United States Government, unless otherwise specifically indicated. The Government fiscal year begins on October 1 and ends on September 30.

g. The term "functional portion of the Project" shall mean a completed portion of the Project determined by the Contracting Officer to be suitable for tender to the Local Sponsor to operate and maintain in advance of completion of construction of the entire Project.

h. The term "relocations" shall mean alterations, modifications, lowering or raising in place, and/or new construction related to, but not limited to, existing: railroads, highways, bridges, railroad bridges and approaches thereto, buildings, pipelines, public utilities (such as municipal water and sanitary sewer lines, telephone lines, and storm drains), aerial utilities, cemeteries, and other facilities, structures, and improvements determined by the Government to be necessary for the construction, operation and maintenance of the Project.

i. The term "involuntary acquisition" shall mean the acquisition of lands, easements, and rights-of-way by eminent domain.

j. Words which appear between brackets, whether they appear between or within lines of text, do not constitute a part of this Agreement. They are intended only as instructions regarding the proper completion of this Agreement.

ARTICLE II - OBLIGATIONS OF THE PARTIES

a. The Government, subject to and using funds provided by the Local Sponsor and appropriated by the Congress of the United States, shall expeditiously construct the Project (including alterations or relocations of railroad bridges and approaches thereto), applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. To the extent possible, the Local Sponsor shall be afforded the opportunity to review and comment on all contracts, including relevant plans and specifications, prior to the issuance of invitations for bids. To the extent possible, the Local Sponsor also shall be afforded the opportunity to review and comment on all modifications and change orders prior to the issuance to the contractor of a Notice to Proceed. The Government will consider the comments of the Local Sponsor, but contract awards, modifications, or change orders, and performance of all work on the Project (whether the work is performed under contract or by Government personnel) shall be exclusively within the control of the Government.

b. When the Government determines that the Project, or a functional portion of the Project, is complete, the Government shall turn the completed Project or functional portion over to the Local Sponsor, which shall accept the Project or functional portion and be solely responsible for operating, repairing, maintaining, replacing, and rehabilitating the Project or functional portion in accordance with Article VIII hereof.

c. As further specified in Article VI hereof, the Local Sponsor shall provide, during the period of construction, a cash contribution of 5 percent of total project costs.

d. As further specified in Article III hereof, the Local Sponsor shall provide all lands, easements, rights-of-way, including suitable borrow and dredged material disposal areas, and perform all relocations (excluding railroad bridges and approaches thereto) determined by the Government to be necessary for construction of the Project. To the extent that any of the lands, easements, or rights-of-way provided under this paragraph are already owned as part of the facility or structure being protected, the value of such interests shall not be included in total project costs nor credited towards the Local Sponsor's contribution required under this Article. At its sole discretion, the Government may perform relocations in cases where it appears

that the Local Sponsor's contributions will exceed the maximum non-Federal cost share set out in Article VI.f., subject to the Federal limitation set out in Article II.f.

e. If the value of the allowable contributions provided under paragraphs c. and d. of this Article represents less than 25 percent of total project costs, the Local Sponsor shall provide during the period of construction an additional cash contribution in the amount necessary to make its total contribution equal to 25 percent of total project costs.

[ONLY ONE OF THE TWO FOLLOWING SUBPARAGRAPHS WILL APPLY;
STRIKE THROUGH THE ONE WHICH DOES NOT APPLY]

~~OPTION 1:~~

~~XXXXX The Government's participation in the Project, including all planning studies costs, has a statutory limitation of \$500,000. The Local Sponsor shall be responsible for all costs in excess of \$500,000, notwithstanding that the Project qualifies for a reduction of the maximum non-Federal cost share under the ASBRY Tax Pay Test.~~

[OPTION 2:]

f. The Government's participation in the Project, including all planning studies costs, has a statutory limitation of \$500,000. The Local Sponsor shall be responsible for all costs in excess of \$500,000.

g. The Local Sponsor shall comply with all items of local cooperation set out in the aforementioned report, entitled

Detailed Project Report, Main Trunk Sewer Line, North Nashua River,

Leominster, Massachusetts

prepared by New England Division dated 28 July 1992 and

approved by Division Engineer on 9 October 1992.
[DATE]

h. No Federal funds may be used to meet the Local Sponsor's share of project costs under this Agreement unless the expenditure of such funds is expressly authorized by statute as verified in writing by the granting agency.

ARTICLE III - LANDS, FACILITIES, AND PUBLIC LAW 91-646
RELOCATION ASSISTANCE

a. The Local Sponsor shall furnish to the Government all lands, easements, and rights-of-way, including suitable borrow and dredged material disposal areas, as may be determined by the Government to be necessary for construction, operation, and maintenance of the Project, and shall furnish to the Government evidence supporting the Local Sponsor's legal authority to grant rights-of-entry to such lands. The necessary lands, easements, and rights-of-way shall be provided prior to the advertisement of any construction contract.

b. The Local Sponsor shall provide or pay to the Government the full cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged material disposal areas necessary for construction of the Project.

c. Upon notification from the Government, the Local Sponsor shall accomplish, or arrange for accomplishment at no cost to the Government, all relocations (excluding railroad bridges and approaches thereto) determined by the Government to be necessary for construction of the Project.

d. The Local Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the Project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act. The Local Sponsor shall provide such documentation as the Contracting Officer requires to demonstrate compliance.

ARTICLE IV - VALUE OF LANDS AND FACILITIES

a. The value of the lands, easements, and rights-of-way to be included in total project costs and credited towards the Local Sponsor's share of total project costs will be determined in accordance with the following procedures:

1. If the lands, easements, or rights-of-way are owned by the Local Sponsor as of the date the first construction contract for the Project is awarded, the credit shall be the fair market value of the interest at the time of such award. The fair market value shall be determined by an appraisal, to be obtained by the Local Sponsor, which has been prepared by a qualified appraiser who is acceptable to both the Local Sponsor and the Government. The appraisal shall be reviewed and approved by the Government.

2. If the lands, easements, or rights-of-way are acquired by the Local Sponsor after the date of award of the first construction contract for the Project, the credit shall be the fair market value of the interest at the time such interest is acquired. The fair market value shall be determined as specified in Article IV.a.1. of this Agreement. If the Local Sponsor pays an amount in excess of the appraised fair market value, it may be entitled to a credit for the purchase price paid, if the Local Sponsor has secured prior written approval from the Government of the purchase price.

3. If the Local Sponsor acquires more lands, easements, or rights-of-way than are necessary for project purposes, as determined by the Government, then only the value of such portions of those acquisitions as are necessary for project purposes shall be included in total project costs and credited towards the Local Sponsor's share.

4. Credit for lands, easements, and rights-of-way in the case of involuntary acquisitions which occur within a one-year period preceding the date this Agreement is signed or which occur after the date this Agreement is signed will be based on court awards, or on stipulated settlements that have received prior written Government approval.

5. For lands, easements, or rights-of-way acquired by the Local Sponsor within a five-year period preceding the date this Agreement is signed, or any time after this Agreement is signed, credits provided under this paragraph will also include the actual incidental costs of acquiring the interest, e.g., closing and title costs, appraisal costs, survey costs, attorney's fees, plat maps, and mapping costs, as well as the actual amounts expended for payment of any Public Law 91-646 relocation assistance benefits provided in accordance with the obligations under this Agreement.

b. The costs of relocations which will be included in total project costs and credited towards the Local Sponsor's share of total project costs shall be that portion of the actual costs as set forth below and approved by the Government:

1. Highways and Highway Bridges: Only that portion of the cost as would be necessary to construct substitute bridges and highways to the design standard that the State of Massachusetts would use in constructing a new bridge or highway under similar conditions of geography and traffic loads.

2. Utilities and Facilities (including Railroads): Actual relocation costs less depreciation, less salvage value, plus the cost of removal, less the cost of betterments. With respect to betterments, new materials shall not be used in any relocation or alteration if materials of value and usability equal to those in the existing facility are available or can be obtained as salvage from the existing facility or otherwise, unless the provision of new material is more economical. If, despite the availability of used material, new material is used, where the use of such new material represents an additional cost, such cost will not be included in total project costs, nor credited towards the Local Sponsor's share.

ARTICLE V - CONSTRUCTION PHASING AND MANAGEMENT

a. To provide for consistent and effective communication between the Local Sponsor and the Government during the period of construction, the Local Sponsor and the Government shall appoint representatives to coordinate on scheduling, plans, specifications, modifications, contract costs, and other matters relating to construction of the Project. The Local Sponsor will be informed of any changes in cost estimates.

b. The representatives appointed above shall meet as necessary during the period of construction and shall make such recommendations as they deem warranted to the Contracting Officer.

c. The Contracting Officer shall consider the recommendations of the representatives in all matters relating to the Project, but the Contracting Officer, having ultimate responsibility for construction of the Project, has complete discretion to accept, reject, or modify the recommendations.

ARTICLE VI - METHOD OF PAYMENT

a. The Local Sponsor shall provide, during the period of construction, the amounts required under Articles II.c., II.e., and II.f. of this Agreement. Total project costs are presently estimated to be \$ 300,000. In order to meet its share, the Local Sponsor must provide a cash contribution presently estimated to be \$ 75,000.

b. The required cash contribution shall be provided as follows: [AT LEAST 30] 30 calendar days prior to the award of the first construction contract, the Government shall notify the Local Sponsor of the Local Sponsor's estimated share of project costs, including its share of costs attributable to the Project incurred prior to the initiation of construction. Within [HALF THE ABOVE NUMBER] 15 calendar days thereafter, the Local Sponsor shall provide the Government the full amount of the required contribution by delivering a check payable to "FAO, USAED, NED" to the Contracting Officer representing the Government. In the event that total project costs are expected to exceed the estimate given at the outset of construction, the Government shall immediately notify the Local Sponsor of the additional contribution the Local Sponsor will be required to make to meet its share of the revised estimate. Within [NO MORE THAN 45] 45 calendar days thereafter, the Local Sponsor shall provide the Government the full amount of the additional required contribution.

c. The Government will draw on the funds provided by the Local Sponsor such sums as it deems necessary to cover contractual and in-house fiscal obligations attributable to the Project as they are incurred, as well as costs incurred by the Government prior to the initiation of construction.

d. Upon completion of the Project and final determination of the costs associated with all relevant contract claims and court actions, including appeals, the Government shall compute the total project costs and tender to the Local Sponsor a final accounting of the Local Sponsor's share of total project costs. In the event the total contribution by the Local Sponsor is less than its minimum required share of total project costs, the Local Sponsor shall, no later than 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet its minimum required share of total project costs.

e. In the event the Local Sponsor has made cash contributions in excess of 5 percent of total project costs which result in the Local Sponsor having provided more than its required share of total project costs, the Government shall, no later than 90 calendar days after the final accounting is complete, subject to the availability of appropriations for that purpose, and subject to the \$500,000.00 Federal limitation set out in Article II.f., return said excess to the Local Sponsor; however, the Local Sponsor shall not be entitled to any refund of the 5 percent cash contribution required pursuant to Article II.c. of this Agreement.

f. If the Local Sponsor's total contribution under this Agreement (including allowable credits for lands, easements, rights-of-way, relocations, and suitable borrow and dredged material disposal areas provided for the Project by the Local Sponsor) exceeds [EITHER 50, IF NO QUALIFICATION UNDER ABILITY TO PAY TEST, OR THE APPROPRIATE ABILITY TO PAY PERCENTAGE, IF THE PROJECT QUALIFIES] 50 percent of total project costs, the Government shall, subject to the availability of appropriations for that purpose, and subject to the \$500,000.00 Federal limitation set out in Article II.f., refund the excess to the Local Sponsor no later than 90 calendar days after the final accounting is complete.

ARTICLE VII - DISPUTES

Before any party to this Agreement may bring suit in any court concerning an issue relating to this Agreement, such party must first seek in good faith to resolve the issue through negotiation or other forms of nonbinding alternative dispute resolution mutually acceptable to the parties.

ARTICLE VIII - OPERATION, MAINTENANCE, REPLACEMENT, AND REHABILITATION

a. After the Government has turned the completed Project, or functional portion of the Project, over to the Local Sponsor, the Local Sponsor shall operate, repair, maintain, replace, and rehabilitate the completed Project, or functional portion of the Project, in accordance with regulations or directions prescribed by the Government.

b. The Local Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land which it owns or controls for access to the Project for the purpose of inspection, and, if necessary, for the purpose of

completing, operating, repairing, maintaining, replacing, or rehabilitating the Project. If an inspection shows that the Local Sponsor for any reason is failing to fulfill its obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Local Sponsor. If the Local Sponsor persists in such failure for 30 calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon lands the Local Sponsor owns or controls for access to the Project for the purpose of completing, operating, repairing, maintaining, replacing, or rehabilitating the Project. No completion, operation, repair, maintenance, replacement, or rehabilitation by the Government shall operate to relieve the Local Sponsor of responsibility to meet its obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE IX - RELEASE OF CLAIMS

The Local Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the Project, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE X - MAINTENANCE OF RECORDS

The Government and the Local Sponsor shall keep books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to this Agreement to the extent and in such detail as will properly reflect total project costs. The Government and the Local Sponsor shall maintain such books, documents, and other evidence for a minimum of three years after completion of construction of the Project and resolution of all claims arising therefrom, and shall make available at their offices at reasonable times, such books, records, documents, and other evidence for inspection and audit by authorized representatives of the parties to this Agreement.

ARTICLE XI - GOVERNMENT AUDIT

The Government shall conduct an audit when appropriate of the Local Sponsor's records for the Project to ascertain the allowability, reasonableness, and allocability of its costs for inclusion as credit against the non-Federal share of project costs.

ARTICLE XII - FEDERAL AND STATE LAWS

In acting under its rights and obligations hereunder, the Local Sponsor agrees to comply with all applicable Federal and State laws and regulations, including section 601 of Title VI of the Civil Rights Act of 1964, Public Law 88-352, and Department of Defense Directive 5500.II issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army".

ARTICLE XIII - RELATIONSHIP OF PARTIES

The parties to this Agreement act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, or employee of the other.

ARTICLE XIV - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE XV - COVENANT AGAINST CONTINGENT FEES

The Local Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bonafide employees or bonafide established commercial or selling agencies maintained by the Local Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in its discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE XVI - TERMINATION OR SUSPENSION

a. If at any time the Local Sponsor fails to make the payments required under this Agreement, the Secretary of the Army shall terminate or suspend work on the Project until the Local Sponsor is no longer in arrears, unless the Secretary of the Army determines that continuation of work on the Project is in the

interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the Project . Any delinquent payment shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceeds 3 months.

b. If the Government fails to receive annual appropriations for the Project in amounts sufficient to meet project expenditures for the then-current or upcoming fiscal year, the Government shall so notify the Local Sponsor. After 60 calendar days either party may elect without penalty to terminate this Agreement or to defer future performance hereunder; however, deferral of future performance under this Agreement shall not affect existing obligations or relieve the parties of liability for any obligation previously incurred. In the event that either party elects to terminate this Agreement, pursuant to this Article, both parties shall conclude their activities relating to the Project and proceed to a final accounting in accordance with Article VI of this Agreement. In the event that either party elects to defer future performance under this Agreement, such deferral shall remain in effect until such time as the Government receives sufficient appropriations or either party elects to terminate this Agreement.

ARTICLE XVII - NOTICES

a. All notices, requests, demands, and other communications required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally, given by prepaid telegram, or mailed by first-class (postage-prepaid), registered, or certified mail, as follows:

If to the Local Sponsor:

Mr. Gene Cavanaugh

Division of Waterways

Department of Environmental Management

200 Cambridge St. Boston, Massachusetts

[FULL ADDRESS]

If to the Government:

Division Engineer; New England Division, Corps of Engineers,

424 Trapelo Road; Waltham, Massachusetts 02254-9149

[FULL ADDRESS]

b. A party may change the address to which such communications are to be directed by giving written notice to the other in the manner provided in this Article.

c. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at such time as it is personally delivered or seven days after it is mailed, as the case may be.

ARTICLE XVIII - CONFIDENTIALITY

To the extent permitted by the law governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE XIX - HAZARDOUS SUBSTANCES

a. After execution of this Agreement and upon direction by the Contracting Officer, the Local Sponsor shall perform, or cause to be performed, such environmental investigations as are determined necessary by the Government or the Local Sponsor to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC 9601-9675, on lands necessary for Project construction, operation, and maintenance. All actual costs incurred by the Local Sponsor which are properly allowable and allocable to performance of any such environmental investigations shall be included in total project costs and cost shared as a construction cost in accordance with Section 103 of Public Law 99-662.

b. In the event it is discovered through an environmental investigation or other means that any lands, easements, rights-of-way, or disposal areas to be acquired or provided for the Project contain any hazardous substances regulated under

CERCLA, the Local Sponsor and the Government shall provide prompt notice to each other, and the Local Sponsor shall not proceed with the acquisition of lands, easements, rights-of-way, or disposal areas until mutually agreed.

c. The Government and the Local Sponsor, shall determine whether to initiate construction of the Project, or if already in construction, to continue with construction of the Project, or to terminate construction of the Project for the convenience of the Government in any case where hazardous substances regulated under CERCLA are found to exist on any lands necessary for the Project. Should the Government and the Local Sponsor determine to proceed or continue with construction after considering any liability that may arise under CERCLA, as between the Government and the Local Sponsor, the Local Sponsor shall be responsible for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of total project costs as defined in this Agreement. In the event the Local Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge its responsibilities under this paragraph upon direction by the Government, the Government may either terminate or suspend work on the Project or proceed with further work as provided in Article XVI of this Agreement.

d. The Local Sponsor and the Government shall consult with each other under the Construction Phasing and Management Article of this Agreement to assure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph c of this Article shall not relieve any party from any liability that may arise under CERCLA.

e. The Local Sponsor shall operate, maintain, repair, replace, and rehabilitate the Project in a manner so that liability will not arise under CERCLA.

ARTICLE XX - APPROVAL OF AGREEMENT

The New England Division Engineer.
[LOCATION] [DISTRICT/DIVISION]

is authorized to execute this Agreement on behalf of the Government, provided no modification is made to this Agreement other than completion in accordance with the bracketed instructions. If any such modification is made, this Agreement shall be subject to the written approval of the Assistant Secretary of the Army (Civil Works) and is not binding on the Government until so approved.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THE DEPARTMENT OF THE ARMY

BY:

Earle C. Richardson
[SIGNATURE]

EARLE C. RICHARDSON

[TYPED NAME]

COL, EN

Division Engineer

[SELECT ONE]

District/Division
Engineer

DATE: 1 DECEMBER 1994

THE LOCAL SPONSOR

BY:

Peter C. Webber
[SIGNATURE]

PETER C. WEBBER

[TYPED NAME]

Commissioner, Department
of Environmental Management

[TITLE IN FULL]

DATE:

7/11/94

Approved:

William F. Weld
William Weld
Governor

CERTIFICATE OF AUTHORITY

I, Scott Harshbarger, do hereby certify that I am
[TYPED OR PRINTED NAME]
the Attorney General of the Commonwealth of Mass and that the Department of
[TITLE] [LOCAL SPONSOR]
Environmental Mgmt. is a legally constituted public body with full
[LOCAL SPONSOR]
authority and capability to perform the terms of the Agreement
between the Department of the Army and Department of Environmental
[LOCAL
Management] in connection with North Nashua River (Sewer Line) and
[NAME OF PROJECT]
to pay damages, if necessary, in the event of the failure to
perform, in accordance with Section 221 of Public Law 91-611 and
that the person(s) who has/have executed the Agreement on behalf
of the Commonwealth of Mass. has/have acted within their statutory
[LOCAL SPONSOR]
authority, subject to appropriation of funds by the Massachusetts Legislature.
IN WITNESS WHEREOF, I have made and executed this Certificate of
Authority this 9th day of August, 1994.

[PLACE SEAL AND/OR
ACKNOWLEDGMENT(S)
IF NECESSARY
FOR EXECUTION OF THIS
DOCUMENT--THE DEPARTMENT
OF THE ARMY DOES NOT
REQUIRE EITHER.]



[SIGNATURE]

SCOTT HARSHBARGER
[TYPED NAME]

Attorney General
Commonwealth of
Massachusetts
[TITLE IN FULL]

CERTIFICATION OF LEGAL REVIEW

The draft Local Cooperation Agreement for Emergency Streambank


Protection, Main Trunk Sewer Line, North Nashua River, Leominster, MA

[NAME OF PROJECT]

has been fully reviewed by the Office of Counsel, USAED,

New England Division.

[LOCATION]


District Counsel

CERTIFICATION REGARDING LOBBYING


The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.


PETER C. WEBBER
Commissioner

APPENDIX C

INSPECTION REPORT FORMS

DESIGNATION OF SUPERINTENDENT

Name Of Project: _____

Location: _____

MAINTAINING MUNICIPAL AGENCY:

Agency: _____

Address: _____ Tel. No. _____

"SUPERINTENDENT" - as required by Section 208.10 (a) (2), Chap II,
Title 33 USC

Name & Title: _____

Employed by: _____

Business Address: _____

Business Tel. No: _____

Nights, Sundays, Address: _____

Nights, Sundays, Tel. No: _____

Remarks:

Signed _____

Title: _____

Date: _____

NOTE: To be submitted and updated as necessary by the responsible agency which will maintain and operate the works in accordance with regulations prescribed by the Secretary of the Army as required by law (Title 33, Chap. 208, Sec II, USC).

INSPECTION FORM

EMERGENCY STREAMBANK PROJECT

LEOMINSTER, MASSACHUSETTS

DATE OF INSPECTION: _____	COMMENTS
<p>1. TYPE OF INSPECTION</p> <p><input type="checkbox"/> Semi-Annual <input type="checkbox"/> 90-Day <input type="checkbox"/> Other (Comment)</p> <p>2. GENERAL CONDITION.....<input type="checkbox"/> GOOD <input type="checkbox"/> FAIR <input type="checkbox"/> POOR</p> <p>Good Interlocking of Stone Protection.....<input type="checkbox"/> Yes <input type="checkbox"/> No Scour at Toe Occuring.....<input type="checkbox"/> Yes <input type="checkbox"/> No (Length _____ Width _____ Depth _____) Loss of Section.....<input type="checkbox"/> Yes <input type="checkbox"/> No (Length _____ Width _____ Depth _____) Debris on Structure.....<input type="checkbox"/> Yes <input type="checkbox"/> No Vegetation Growing through Structures.....<input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3. CREST</p> <p>General Condition.....<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor Displacement of Stone.....<input type="checkbox"/> Yes <input type="checkbox"/> No Settlement.....<input type="checkbox"/> Yes <input type="checkbox"/> No Sloughing/Slumping.....<input type="checkbox"/> Yes <input type="checkbox"/> No Exposed Underlayer.....<input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>4. SLOPES</p> <p>General Condition.....<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor Displacement of Stone.....<input type="checkbox"/> Yes <input type="checkbox"/> No Settlement.....<input type="checkbox"/> Yes <input type="checkbox"/> No Sloughing/Slumping.....<input type="checkbox"/> Yes <input type="checkbox"/> No Exposed Underlayer.....<input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5. TOE</p> <p>General Condition.....<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor Displaced Stone.....<input type="checkbox"/> Yes <input type="checkbox"/> No Settlement.....<input type="checkbox"/> Yes <input type="checkbox"/> No Sloughing/Slumping.....<input type="checkbox"/> Yes <input type="checkbox"/> No Exposed Underlayer.....<input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>6. CONDITION OF OTHER ITEMS</p> <p>Pipe Ends and Outlets.....<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor</p>	
<p><u>NOTE: ALL IRREGULARITIES AND DEFICIENCIES SHALL BE DISCUSSED FULLY IN THE COMMENT COLUMN.</u></p>	

**INSPECTION FORM
EMERGENCY STREAMBANK PROJECT
LEOMINSTER, MASSACHUSETTS
(CONTINUED)**

7. CHANGE IN RIVER FLOW CONDITIONS ☐ YES ☐ NO

Describe any changes in flow since previous inspection such as snags, ice build-up, sediment build-up, debris or other?

COMMENTS

8. PHOTOGRAPHS ATTACHED..... ☐ YES ☐ NO

If not, please explain why not.

9. HAS ANY MAINTENANCE BEEN PERFORMED SINCE THE LAST INSPECTION?..... ☐ YES ☐ NO

If yes, please describe maintenance and provide date performed.

10. RECOMMENDATIONS

NOTE: Marked up copies of as built drawings may be submitted for areas of damage.

REPORT:

Prepared by: _____

Type or Print Name/Agency

Submitted by: _____

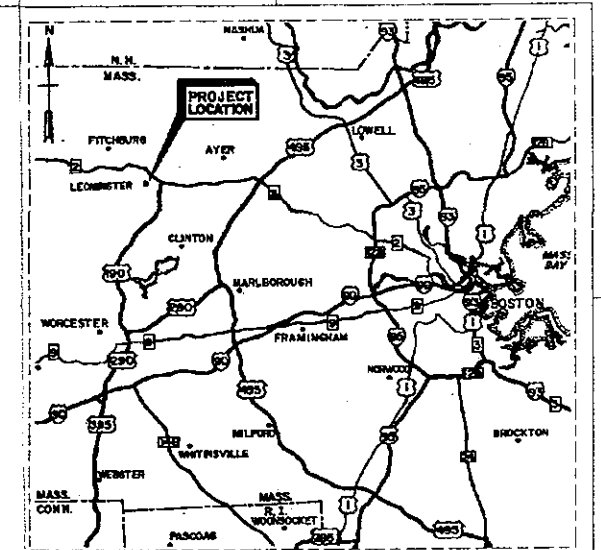
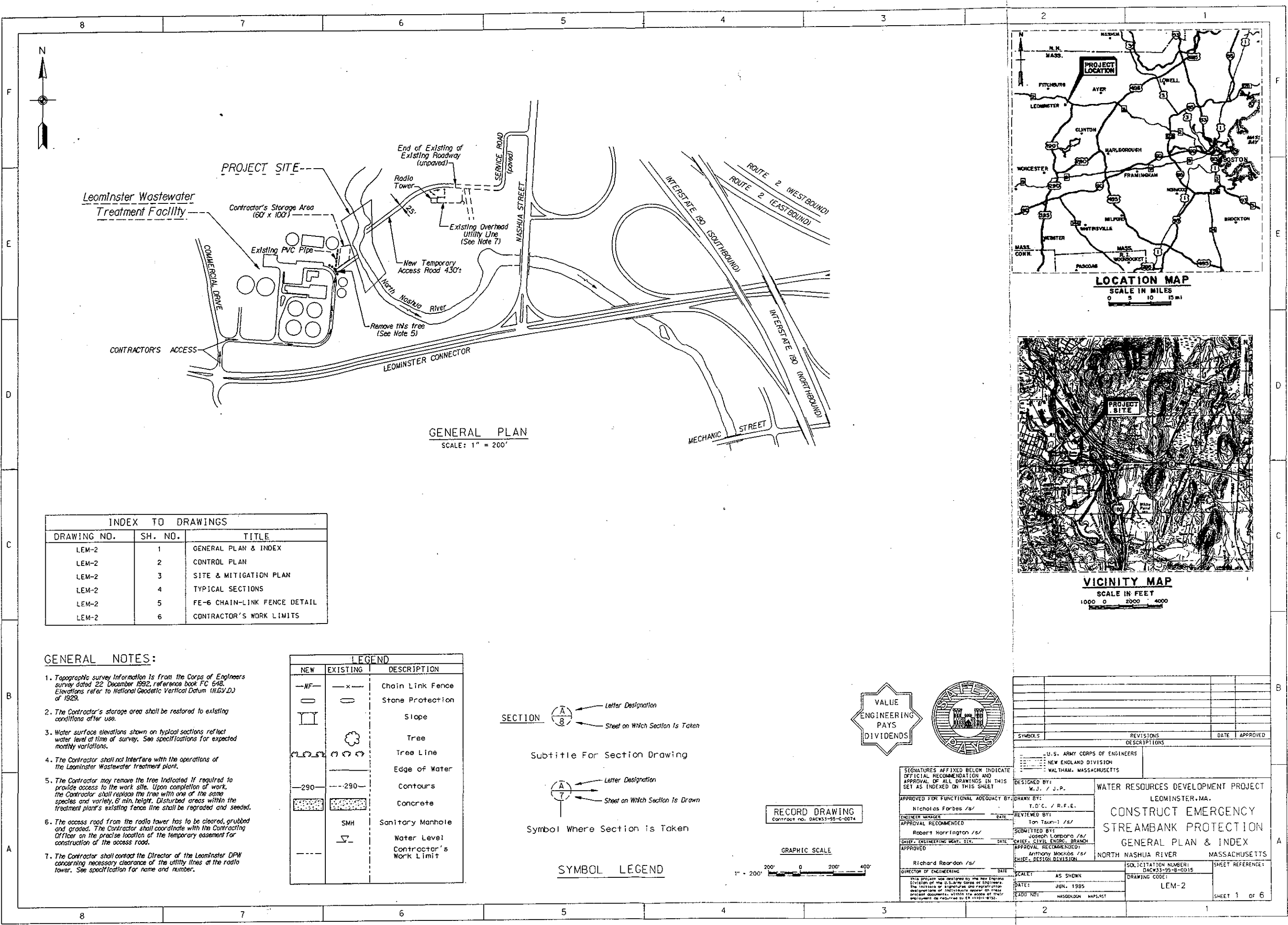
Type or Print Title/Agency

Signature

Date

APPENDIX D

AS-BUILT DRAWINGS



LOCATION MAP
SCALE IN MILES
0 5 10 15 mi

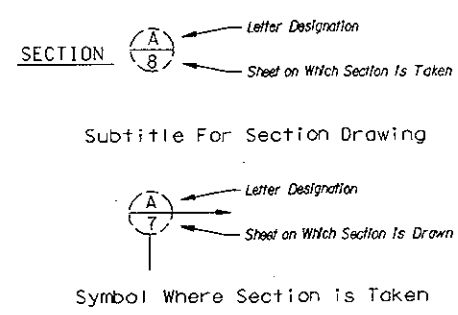


VICINITY MAP
SCALE IN FEET
1000 0 2000 4000

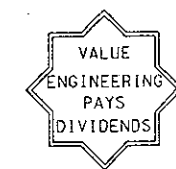
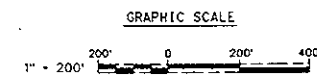
INDEX TO DRAWINGS		
DRAWING NO.	SH. NO.	TITLE
LEM-2	1	GENERAL PLAN & INDEX
LEM-2	2	CONTROL PLAN
LEM-2	3	SITE & MITIGATION PLAN
LEM-2	4	TYPICAL SECTIONS
LEM-2	5	FE-6 CHAIN-LINK FENCE DETAIL
LEM-2	6	CONTRACTOR'S WORK LIMITS

- GENERAL NOTES:
- Topographic survey information is from the Corps of Engineers survey dated 22 December 1992, reference book FC 648. Elevations refer to National Geodetic Vertical Datum (NGVD) of 1929.
 - The Contractor's storage area shall be restored to existing conditions after use.
 - Water surface elevations shown on typical sections reflect water level at time of survey. See specifications for expected monthly variations.
 - The Contractor shall not interfere with the operations of the Leominster Wastewater treatment plant.
 - The Contractor may remove the tree indicated if required to provide access to the work site. Upon completion of work, the Contractor shall replace the tree with one of the same species and variety, 6 min. height. Disturbed areas within the treatment plant's existing fence line shall be regraded and seeded.
 - The access road from the radio tower has to be cleared, grubbed and graded. The Contractor shall coordinate with the Contracting Officer on the precise location of the temporary easement for construction of the access road.
 - The Contractor shall contact the Director of the Leominster DPW concerning necessary clearance of the utility lines at the radio tower. See specification for name and number.

LEGEND		
NEW	EXISTING	DESCRIPTION
—NF—	—x—	Chain Link Fence
—	—	Stone Protection
—	—	Slope
—	—	Tree
—	—	Tree Line
—	—	Edge of Water
—290—	—290—	Contours
—	—	Concrete
—	SMH	Sanitary Manhole
—	—	Water Level
—	—	Contractor's Work Limit



SYMBOL LEGEND



SIGNATURES AFFIXED BELOW INDICATE OFFICIAL RECOMMENDATION AND APPROVAL OF ALL DRAWINGS IN THIS SET AS INDEXED ON THIS SHEET

APPROVED FOR FUNCTIONAL ADEQUACY BY: Nicholas Forbes /s/

APPROVAL RECOMMENDED: Robert Harrington /s/

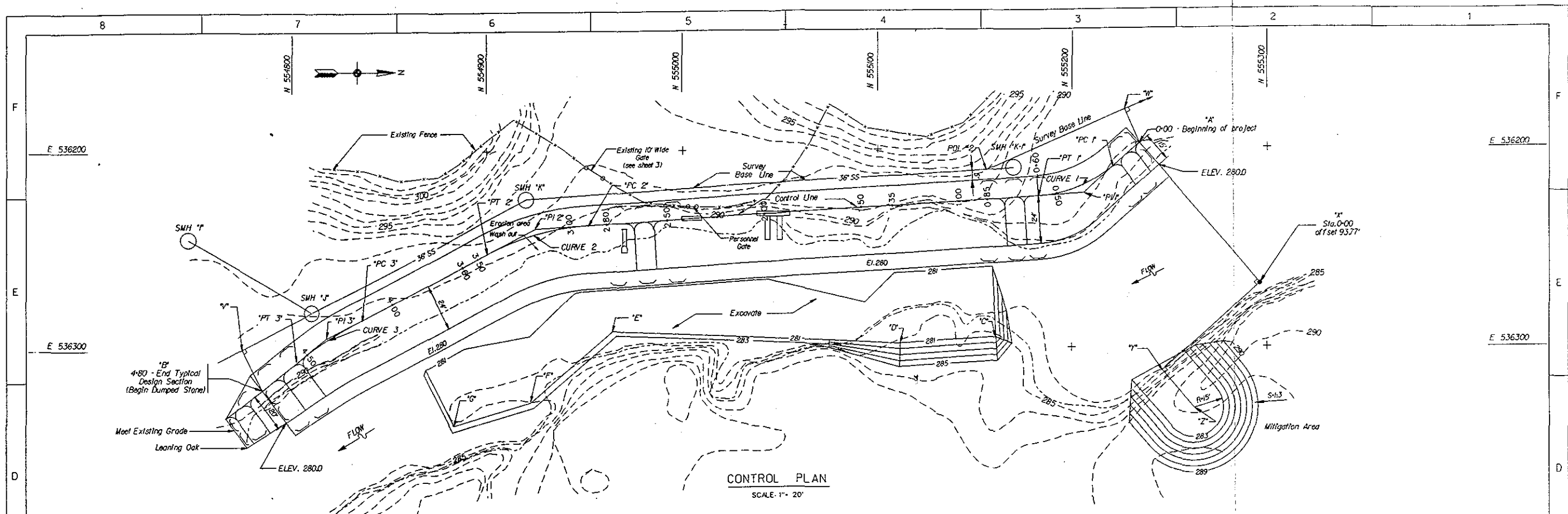
CHIEF - ENGINEERING UNIT, DIV. APPROVED: Richard Reardon /s/

DIRECTOR OF ENGINEERING

DATE: JUN. 1995

THIS PROJECT WAS DESIGNED BY THE NEW ENGLAND DIVISION OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY 48 CFR 101-11.6-3.

DESIGNED BY: W.J. / J.P.	WATER RESOURCES DEVELOPMENT PROJECT
DRAWN BY: T.D.C. / R.F.E.	LEOMINSTER, MA.
REVIEWED BY: Tom Tsun-1 /s/	CONSTRUCT EMERGENCY
SUBMITTED BY: JOSEPH LOMBARDI /s/	STREAMBANK PROTECTION
CHIEF - CIVIL ENGR. BRANCH	GENERAL PLAN & INDEX
APPROVAL RECOMMENDED: Anthony Morkos /s/	NORTH NASHUA RIVER
CHIEF - DESIGN DIVISION	MASSACHUSETTS
SOLICITATION NUMBER: DACW33-95-B-0015	DRAWING CODE: LEM-2
DATE: JUN. 1995	SHEET REFERENCE: SHEET 1 OF 6
CADD NO: NASGUDON MAPS.KIT	



CONTROL PLAN
SCALE: 1" = 20'

SURVEY BASE LINE DATA

STATION	COORDINATE	BEARING	DIST.	REMARKS
Manhole "I"	N 554746.63 E 536244.35	N 29°46'15" E	73.56'	See Survey Ties
Manhole "J"	N 554810.48 E 536280.88	N 27°29'34" W	124.32'	See Survey Ties
Manhole "K"	N 554920.76 E 536223.49	N 03°20'52" W	248.93'	See Survey Ties
Manhole "K-1"	N 555169.26 E 536208.95	S 03°20'52" E	13.71'	See Survey Ties
POL #2	N 555226.93 E 536209.75			POL
Point "W"	N 555226.93 E 536179.90	N 22°42'00" W	77.34'	POL for 90° offset to Sta. 0+00.00
0 + 00.00	N 554810.48 E 536197.64			Begin Project
Manhole "J"	N 554810.48 E 536280.88	S 27°29'34" E	41.70'	See Survey Ties
Point "V"	N 554773.49 E 536300.11	N 62°30'26" E	23.63'	POL for 90° offset to Sta. 4+80.00
4 + 80.00	N 554784.28 E 536320.92			End Project

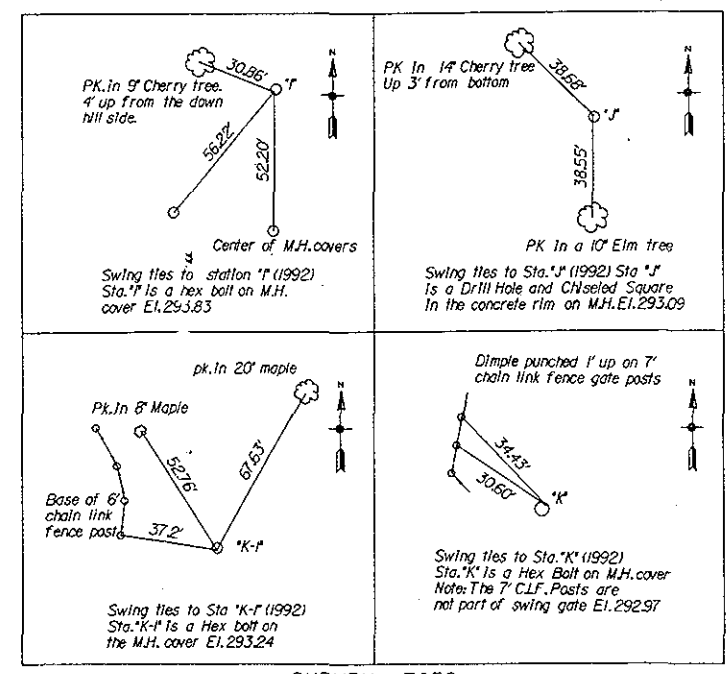
MITIGATION & RIVER EXCAVATION
BASE LINE DATA

POINT	STATION	COORDINATE	BEARING	DIST.	REMARKS
"A"	0+00	N 555234.35 E 536197.64	N 49°01'44" E	93.77'	Begin Project
"X"		N 555295.83 E 536268.44	S 40°58'23" E	66.60'	Mitigation Control Point
"Y"		N 555245.54 E 536312.11	N 49°02'34" E	25.00'	Mitigation Control Point
"Z"		N 555261.93 E 536330.99			C.O.C. 15' R EL. 283 Mitigation Area
"C"	0+85	N 555156.71 E 536225.99	N 86°39'08" E	69.20'	POL for 90° offset to Pt. C
		N 555160.75 E 536295.07			River Excavation Control Point
	1+35	N 555107.66 E 536228.91	N 86°39'08" E	69.20'	POL for 90° offset to Pt. D
"D"		N 555111.96 E 536297.93			River Excavation Control Point
	2+80	N 554961.57 E 536237.54	N 86°39'08" E	54.21'	POL for 90° offset to Pt. E
"E"		N 554964.74 E 536291.72			River Excavation Control Point
	3+60	N 554887.24 E 536258.90	N 62°30'26" E	76.96'	POL for 90° offset to Pt. F
"F"		N 554922.77 E 536327.17			River Excavation Control Point
	4+00	N 554851.76 E 536277.37	N 62°30'26" E	69.17'	POL for 90° offset to Pt. G
"G"		N 554882.63 E 536338.98			River Excavation Control Point

CONTROL LINE & CURVE DATA

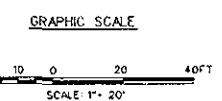
POINT	STATION	STATION		COORDINATE			BEARING	DIST.	CURVE DATA *				REMARKS
		PC	PT	PC	PJ	PT			T(FT)	R(FT)	L(FT)	Δ	
Point W				N 555226.93 E 536179.90			N 67°18'00" E	19.23'					POL for 90° offset to Pt. A
"A"	0 + 00.00			N 555234.35 E 536197.64			S 40°58'23" E	37.92'					Begin Project
"C 1"		0 + 14.70	0 + 59.46	N 555223.25 E 536207.28	N 555205.72 E 536222.50	N 555182.54 E 536223.86	S 03°20'52" E	281.76'	23.22'	68.16'	44.76'	37°37'31"	CURVE #1
"C 2"		2 + 90.94	3 + 44.26	N 554951.45 E 536237.38	N 554924.44 E 536238.96	N 554900.44 E 536251.45	S 27°29'34" E	120.14'	27.06'	126.50'	53.32'	24°08'52"	CURVE #2
"C 3"		4 + 17.37	4 + 57.26	N 554835.61 E 536285.19	N 554817.87 E 536294.42	N 554802.17 E 536306.81	S 38°16'15" E	42.78'	20.00'	211.81'	39.88'	10°47'17"	CURVE #3
"B"	4 + 80.00			N 554784.28 E 536320.92			S 62°30'26" W	23.63'					End of Typical Design Section
"V"				N 554773.49 E 536300.11									POL for 90° offset to Pt. V

* T=Tangent R=Radius
L=Arc Length Δ=Center Angle

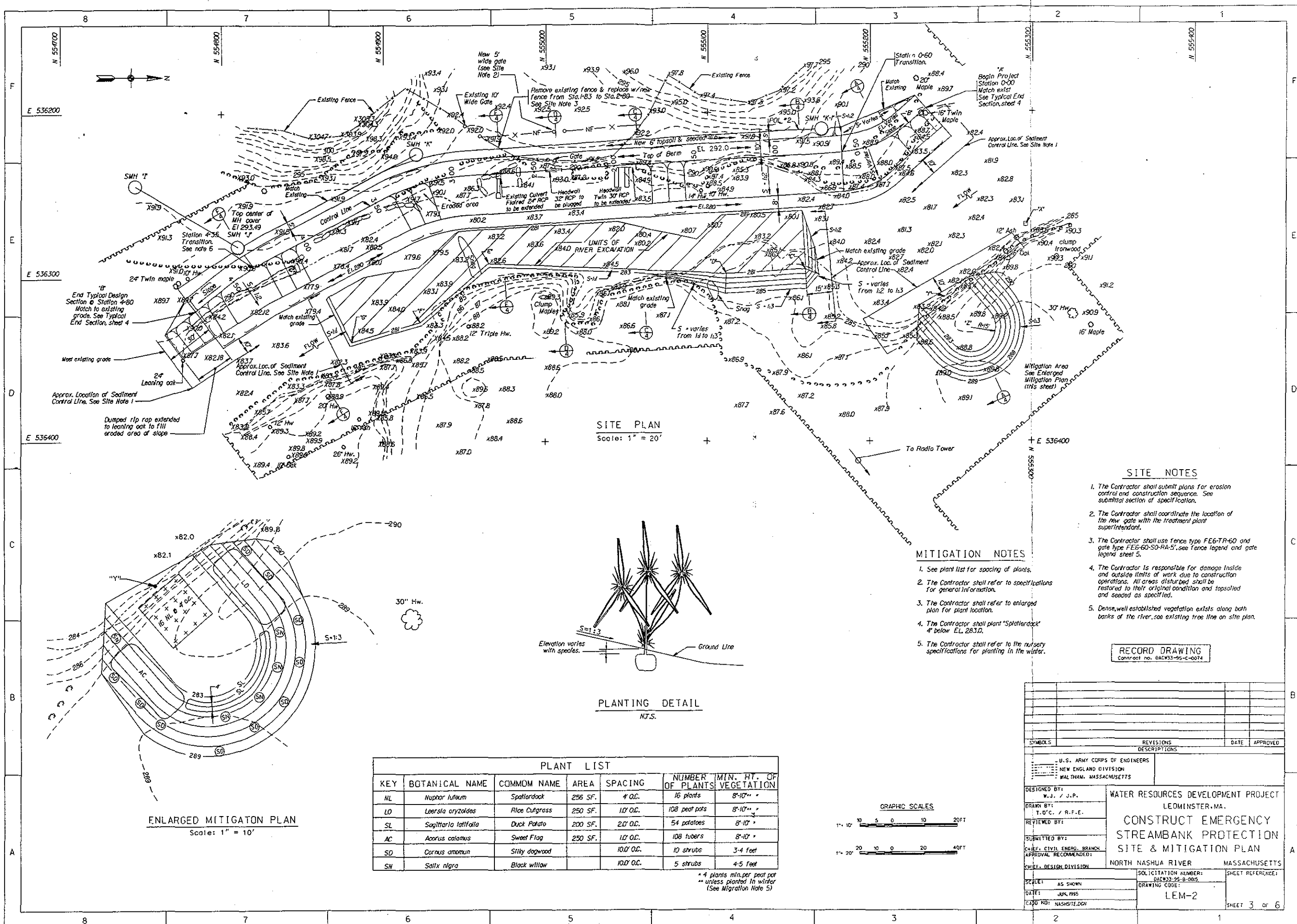


SURVEY TIES
N. T. S.

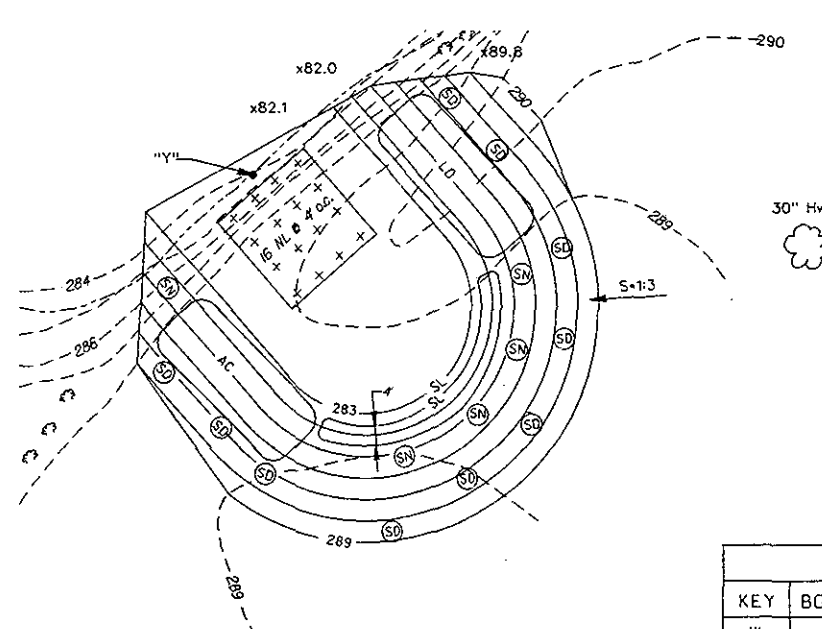
RECORD DRAWING
Contract no. DACW33-95-C-0074



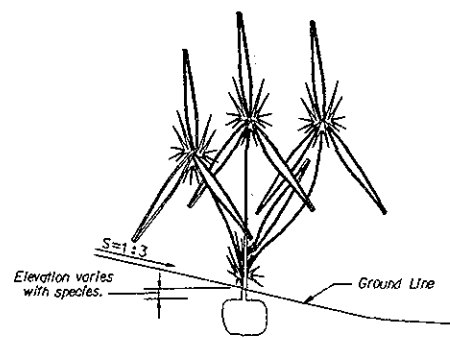
SYMBOLS		REVISIONS		DATE	APPROVED
U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION WALTHAM, MASSACHUSETTS					
DESIGNED BY: W.J. J.P.		WATER RESOURCES DEVELOPMENT PROJECT LEOMINSTER, MA.			
DRAWN BY: T.O.C. / R.F.E.		CONSTRUCT EMERGENCY STREAMBANK PROTECTION CONTROL PLAN			
REVIEWED BY:		NORTH NASHUA RIVER MASSACHUSETTS			
SUBMITTED BY:		SHEET REFERENCE: 2 6			
CHIEF, CIVIL ENGRG. BRANCH		SHEET OF			
APPROVAL RECOMMENDED:		SHEET			
CHIEF, DESIGN DIVISION		SHEET			
SCALE: Noted		SOLICITATION NUMBER: DACW33-95-B-005		DRAWING CODE: LEM-2	
DATE: NOV. 1994		DRAWING CODE: LEM-2		SHEET	
CADD NO: NASHCONV.007		DRAWING CODE: LEM-2		SHEET	



SITE PLAN
Scale: 1" = 20'



ENLARGED MITIGATION PLAN
Scale: 1" = 10'



PLANTING DETAIL
N.T.S.

PLANT LIST					
KEY	BOTANICAL NAME	COMMON NAME	AREA	SPACING	NUMBER MIN. HT. OF PLANTS VEGETATION
NL	<i>Nuphar luteum</i>	Spatterdock	256 SF.	4' O.C.	16 plants 8'-10' "
LO	<i>Leersia oryzoides</i>	Rice Cutgrass	250 SF.	10' O.C.	108 peat pots 8'-10' "
SL	<i>Sagittaria latifolia</i>	Duck Potato	200 SF.	20' O.C.	54 potatoes 8'-10' "
AC	<i>Acorus calamus</i>	Sweet Flag	250 SF.	10' O.C.	108 tubers 8'-10' "
SD	<i>Cornus amomum</i>	Silky dogwood		100' O.C.	10 shrubs 3-4 feet
SN	<i>Salix nigra</i>	Black willow		100' O.C.	5 shrubs 4-5 feet

* 4 plants min. per peat pot
** unless planted in wider
(See Mitigation Note 5)

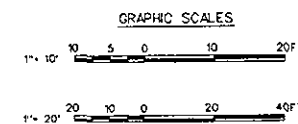
SITE NOTES

1. The Contractor shall submit plans for erosion control and construction sequence. See submittal section of specification.
2. The Contractor shall coordinate the location of the new gate with the treatment plant superintendent.
3. The Contractor shall use fence type FEG-TP-60 and gate type FEG-60-SO-RA-5; see fence legend and gate legend sheet 5.
4. The Contractor is responsible for damage inside and outside limits of work due to construction operations. All areas disturbed shall be restored to their original condition and topsoiled and seeded as specified.
5. Dense, well established vegetation exists along both banks of the river, see existing tree line on site plan.

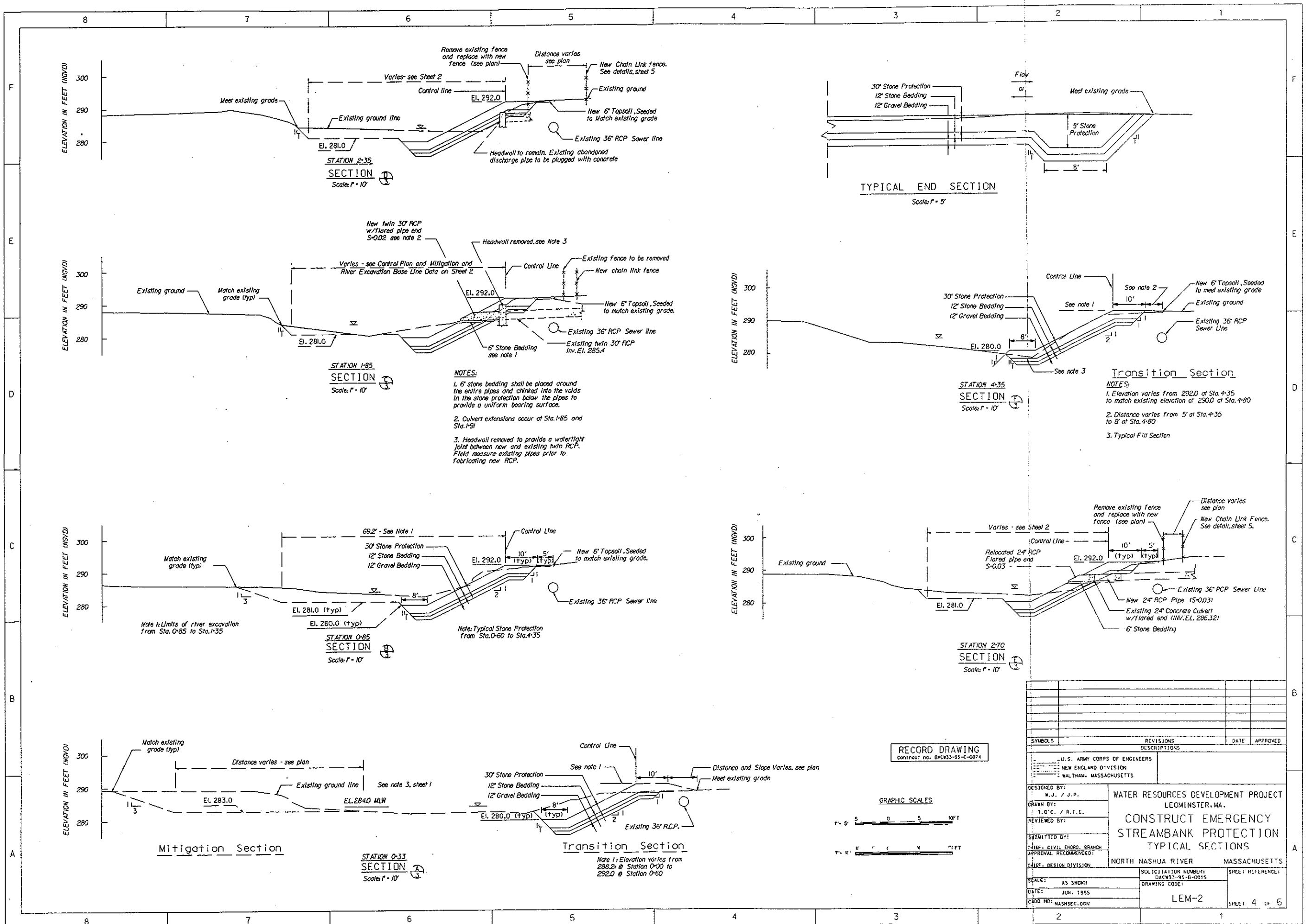
MITIGATION NOTES

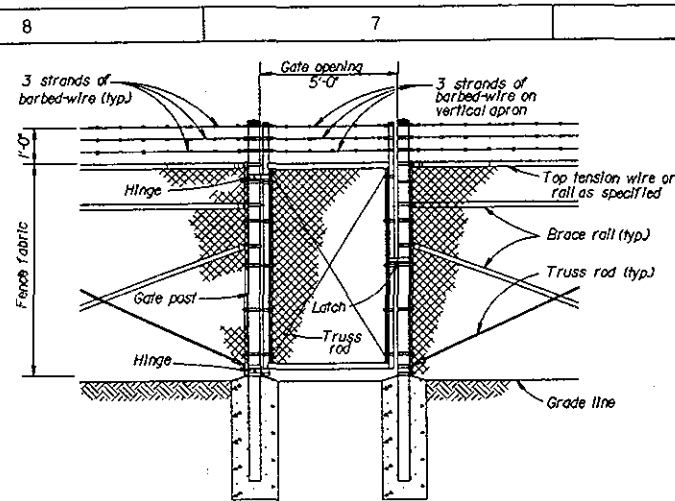
1. See plant list for spacing of plants.
2. The Contractor shall refer to specifications for general information.
3. The Contractor shall refer to enlarged plan for plant location.
4. The Contractor shall plant "Spatterdock" 4' below EL 283.0.
5. The Contractor shall refer to the nursery specifications for planting in the wider.

RECORD DRAWING
Contract no. DACW33-95-C-0074

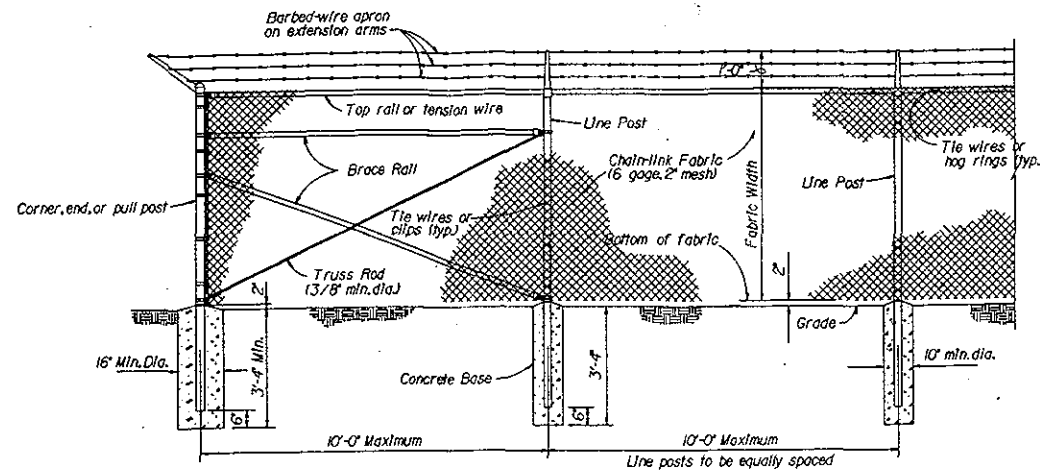


U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION WALTHAM, MASSACHUSETTS		WATER RESOURCES DEVELOPMENT PROJECT LEOMINSTER, MA. CONSTRUCT EMERGENCY STREAMBANK PROTECTION SITE & MITIGATION PLAN	
DESIGNED BY: W.J. / J.P.	DRAWN BY: T.O.C. / R.P.E.	REVIEWED BY:	APPROVAL RECOMMENDED:
SUBMITTED BY:		CHIEF, CIVIL ENGINE BRANCH	
CHIEF, DESIGN DIVISION		NORTH NASHUA RIVER MASSACHUSETTS	
SCALE: AS SHOWN	DATE: JUN 1995	SOLICITATION NUMBER: DACW33-95-B-005	SHEET REFERENCE: SHEET 3 OF 6
CADD NO: NASHUA.DCH	DRAWING CODE: LEM-2		



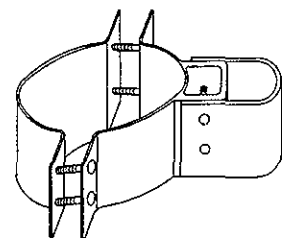


PERSONNEL GATE
TYPE FE-6 FENCE
NO SCALE

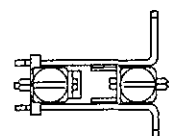


CHAIN-LINK SECURITY FENCE DETAIL
NO SCALE

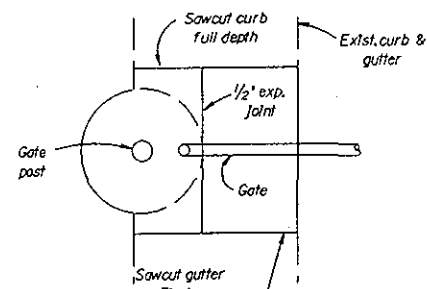
USE AND SECTION	MINIMUM OUTSIDE DIMENSIONS (NOMINAL) FABRIC 72 TO 96"
Corner, End & Pull Posts Tubular - Round	2.875" O.D.
Line Posts Tubular - Round	2.375" O.D.
Top, Bottom & Brace Rails Tubular - Round Tubular - Square H-Section	1.66" O.D. 1.50" O.D. 1.625" x 1.50"
GATE LEAF WIDTH	6' or less



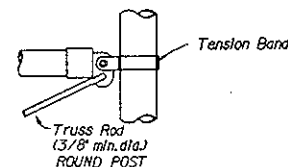
STANDARD HINGE
NO SCALE



LATCH ASSEMBLY
NO SCALE



PLAN
NO SCALE

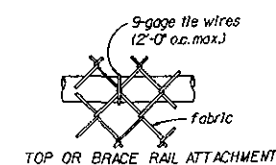


END OR GATE POST DETAIL

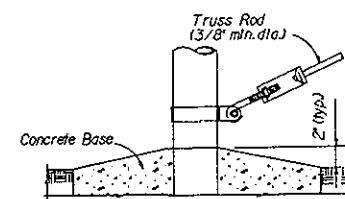


TENSION BAND DETAIL

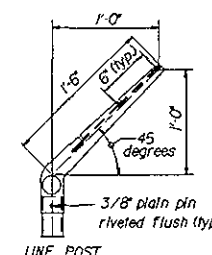
FASTENING DETAILS
NO SCALE



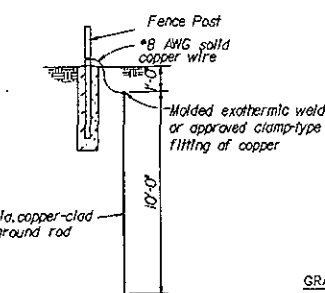
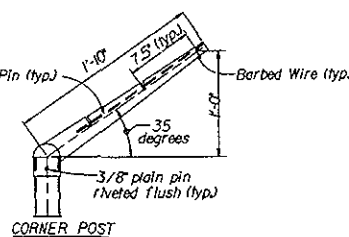
ROUND POST
LINE POST ATTACHMENTS



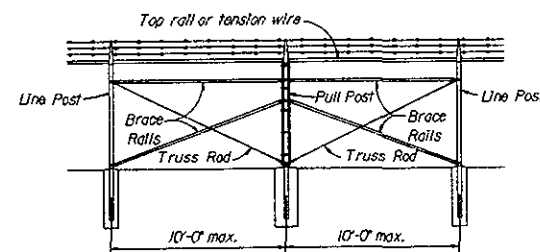
TRUSS ROD AND BAND
NO SCALE



EXTENSION ARM DETAILS
NO SCALE



GROUNDING DETAIL
NO SCALE



BRACE PANEL DETAIL
NO SCALE

NOTE: Provide brace panel whenever straight runs exceed 500 feet.

FENCE LEGEND:
FE6 - CHAIN LINK FENCE WITH BARBED WIRE ON SINGLE OUTRIGGER.
TR - FENCE WITH TOP RAIL.

FINAL NUMBER IS FABRIC WIDTH IN INCHES.

GATE LEGEND:
FE6 - SAME AS FENCE LEGEND.
FENCE HEIGHT - INCHES.
SO - SINGLE OPENING.
RA - STANDARD HINGE.
OPENING - FEET (CLEAR OPENING BETWEEN GATE POSTS).

NOTES:

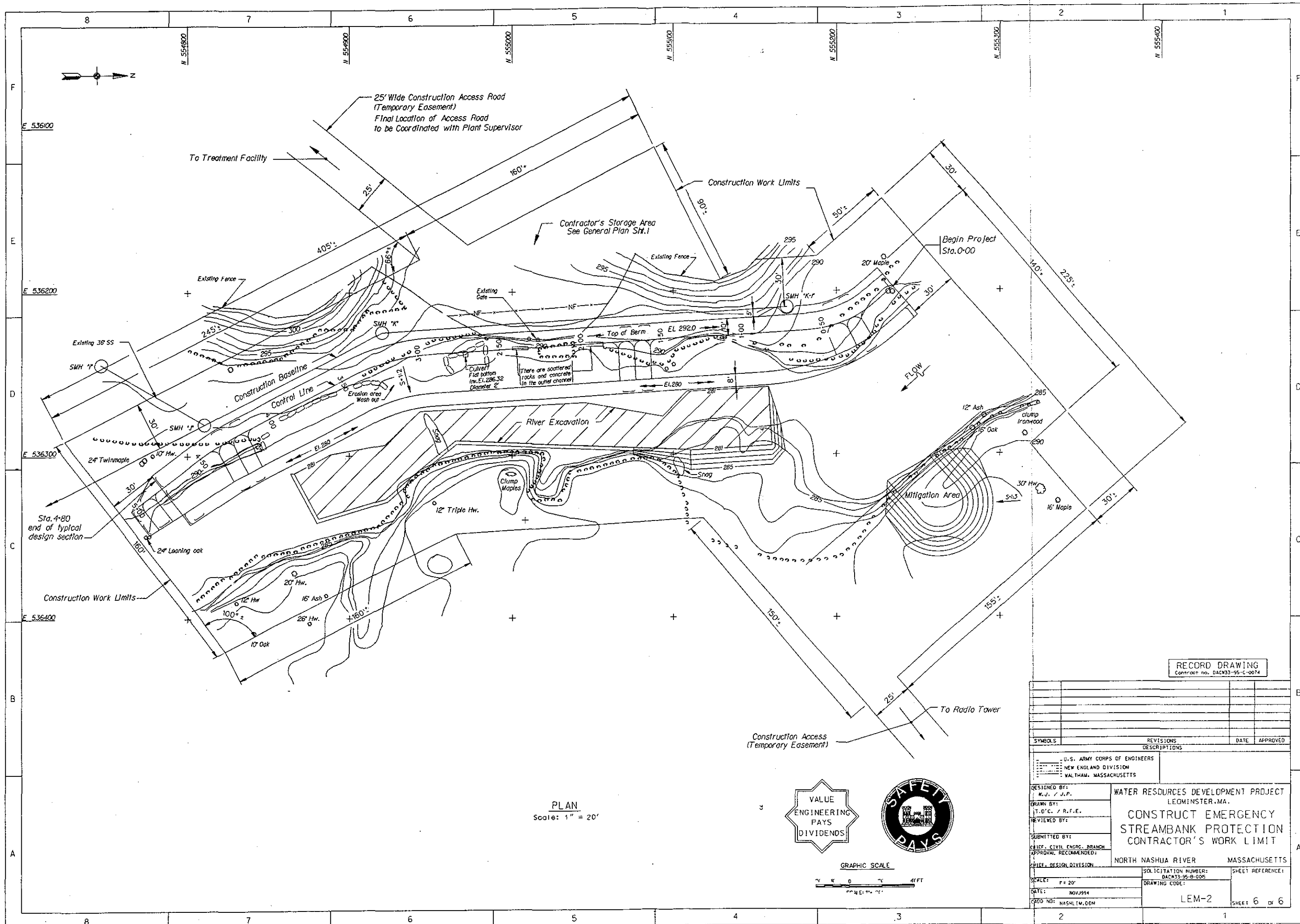
1. New fence shall match existing fence in finish and rail type.
2. Swing Gates shall be constructed with drop rods, padlocks, latch assembly and gate keepers except as noted.
3. Wire ties, rails, posts, and braces shall be constructed on the secure side of the fence alignment. Chain-link fabric shall be placed on the opposite side of the secure area.

RECORD DRAWING
Contract no. DACW33-95-C-0074

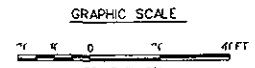
GRAPHIC SCALES

THIS SHEET ADAPTED FROM DRAWINGS
PREPARED BY U.S. ARMY CORPS ENGINEERS
OMAHA DISTRICT MAY 1992.

SYMBOLS		REVISIONS		DATE		APPROVED	
U.S. ARMY CORPS OF ENGINEERS		NEW ENGLAND DIVISION		WALTHAM, MASSACHUSETTS			
DESIGNED BY: W.J. / J.P.		DRAWN BY: T.O.C. / R.F.E.		REVIEWED BY:		SUBMITTED BY:	
CHIEF, CIVIL ENGR. BRANCH		APPROVAL RECOMMENDED:		SHEET DESIGN DIVISION		NORTH NASHUA RIVER MASSACHUSETTS	
SCALE: AS SHOWN		DATE: NOV. 1994		CADD NO: FENDETALL.DGN		SOLICITATION NUMBER: DACW33-95-B-0015	
DRAWING CODE: LEM-2		SHEET REFERENCE: SHEET 5 OF 6					



PLAN
Scale: 1" = 20'



RECORD DRAWING
Contract No. DACW33-95-C-0074

SYMBOLS		REVISIONS		DATE	APPROVED
DESCRIPTIONS		DESCRIPTIONS			
U.S. ARMY CORPS OF ENGINEERS		NEW ENGLAND DIVISION		WALTHAM, MASSACHUSETTS	
DESIGNED BY: R.J. / J.P.		WATER RESOURCES DEVELOPMENT PROJECT LEOMINSTER, MA.			
DRAWN BY: T.O.C. / R.F.E.		CONSTRUCT EMERGENCY STREAMBANK PROTECTION CONTRACTOR'S WORK LIMIT			
REVIEWED BY:		NORTH NASHUA RIVER MASSACHUSETTS			
SUBMITTED BY:		SOLICITATION NUMBER: DACW33-95-C-0074		SHEET REFERENCE:	
APPROVAL, RECOMMENDED:		DRAWING CODE: LEM-2		SHEET 6 OF 6	
DATE: NOV 1994					
CADD NO: NASHUA.DGN					